

AMENDMENTS TO THE DRAWINGS:

The attached sheets of drawings include changes to Figs. 2, 10, 10A and 13. The sheet which includes Fig. 2 replaces the original sheet including Fig. 2, the sheet which includes Fig. 10 replaces the original sheet including Fig. 10, the sheet which includes Fig. 10A replaces the original sheet including Fig. 10A and the sheet which includes Fig. 13 replaces the original sheet including Fig. 13. In Fig. 2, the lead line for reference numeral 110 now touches the airbag and the lead line for reference numeral 152 now points to a clearance between the walls 146, 148 and the sensing mass 141. In Fig. 10, the reference numeral for the lead line pointing to the lever is now 973 and the reference numeral for the lead line pointing to the end of the lever is now 975. Also, Fig. 10 is inverted to be in the correct orientation relative to Fig. 9. Fig. 10A is also inverted to be in the correct orientation relative to Fig. 9. In Fig. 13, the contact 1302 is now better shown on the inside of the top cover 1350 of the sensor housing 1310 along with a clearer separation between contacts 1301 and 1302. Also, the lead line for reference numeral 1341 points to the sensing mass.

Attachments: Four Replacement Sheets
Four Annotated Sheets Showing Changes

REMARKS

Entry of this amendment and reconsideration of the present application, as amended, are respectfully requested.

Claims 1-30 and new claims 31-33 are pending in this application. Claims 1-3, 5, 7-13, 15, 17-23, 25 and 27-30 are amended herein. Unless an argument is made below in support of the patentability of each of these claims over a cited prior art reference in view of an amendment to the claim, the changes to the claims do not relate to patentability.

Objection to the Drawings

In response to the Examiner's objection to the drawings, submitted herewith are replacement sheets for Figs. 2, 10, 10A and 13, and annotated sheets showing changes made to these figures.

In Fig. 2, the lead line for reference numeral 110 now touches the airbag and the lead line for reference numeral 152 now points to a clearance between the walls 146, 148 and the sensing mass 141.

In Fig. 10, the reference numeral for the lead line pointing to the lever is now 973 and the reference numeral for the lead line pointing to the end of the lever is now 975. Also, Fig. 10 is inverted to be in the correct orientation relative to Fig. 9.

Fig. 10A is inverted to be in the correct orientation relative to Fig. 9.

In Fig. 13, the contact 1302 is now better shown on the inside of the top cover 1350 of the sensor housing 1310 along with a clearer separation between contacts 1301 and 1302. Also, the lead line for reference numeral 1341 now points to the sensing mass.

In addition, the specification had been amended to recite that elements 904 and 975 are shown in Fig. 9A (at page 16, lines 26-27), to provide for consistent recitation of element 942 as a firing pin spring, to clarify the position of contact 1302 in the embodiment shown in Fig. 13, and to change the recitation of the direction of movement of mass 1341 in the embodiment shown in Fig. 13 to the left.

With respect to the embodiment shown in Fig. 13, it is respectfully submitted that it was inherent if not readily ascertainable that the contact 1302 was on the inside of the top cover 1350 of the sensor housing 1310, which is the only position in which it could be contacted by the movable contact 1301.

It is respectfully submitted that the changes to Figs. 2, 10, 10A and 13 and the specification as described above do not introduce new matter into the application. Therefore, approval of replacement sheets containing Figs. 2, 10, 10A and 13 is respectfully requested.

In view of the changes to Figs. 2, 10, 10A and 13 and the changes to the specification as described above, it is respectfully submitted that the Examiner's objection to the drawings has been overcome and should be removed.

Objection to the Disclosure

In response to the Examiner's objection to the disclosure, the specification has been amended to remove the informalities noted by the Examiner. With respect to mention of the curved impact plate on page 17, line 19, it is pointed out that such a curved impact plate is indeed mentioned previously at page 16, lines 15-19. With respect to mention of the sensor cover deflecting at page 17, lines 19-21, mention is previously made of the sensor cover 951 oil-canning downward (page 16, lines 21-23), which is the same as a deflection. The specification has been amended to clarify these aspects.

In view of the changes to the specification and the foregoing explanations, it is respectfully submitted that the Examiner's objection to the disclosure has been overcome and should be removed.

Claim Rejections-35 U.S.C. §112

Claims 2, 5, 9, 11, 15, 19, 22, 25 and 29 are amended to remove the informalities noted by the Examiner. In view of the changes to these claims, it is respectfully submitted that the Examiner's rejection of claims 2-20, 22-27 and 29 under 35 U.S.C. §112, second paragraph, has been overcome and should be removed.

Claim Rejections-35 U.S.C. §102(b)/35 U.S.C. §103(a)

Claims 1-5, 7-15, 17-25 and 27-30 were rejected under 35 U.S.C. §102(b) as being anticipated by UK Patent Publication No. 2,255,535 (Haland) and claims 6, 16, 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haland.

The Examiner's rejections are respectfully traversed in view of amendments to independent claims 1, 11 and 21.

Claim 1 is directed to a vehicle having an outer skin along sides of the vehicle, a side impact crash sensor arranged inward from the outer skin and to react to lateral acceleration of the vehicle resulting from an impact of an object with the outer skin along a side of the vehicle, means interposed between the outer skin along the side of the vehicle and the sensor for transferring the lateral acceleration to the sensor; and an occupant restraint device connected to the sensor and arranged to deploy an occupant restraint based on the lateral acceleration. The outer skin of the vehicle along the side of the vehicle may be the outer panel of a door of the vehicle.

Claim 11 includes the feature of mismatch accounting means interposed between the outer skin along the side of the vehicle and the sensor for accounting for mismatch between a point of impact of the object on the outer skin along the side of the vehicle and the sensor.

Instead of mismatch accounting means, claim 21 includes the feature of a transfer structure interposed between the outer skin along the side of the vehicle and the sensor and arranged to transfer the lateral acceleration to the sensor.

Claims 1, 11 and 21 recite a specific construction of the sensor, namely that the sensor includes a housing defining an interior and a mass arranged in the housing interior and movable therein and relative thereto. Such movement of the mass may be in response to lateral acceleration of the housing resulting from the transference of the lateral acceleration of the outer skin of the vehicle to the sensor. Movement of the mass is monitored such that the sensor initiates deployment of the occupant restraint based thereon, e.g., when it is in excess of a threshold value. Various sensors including such movable masses are discussed in the specification.

Haland does not disclose, teach or suggest a sensor having the construction set forth in the claimed embodiments of the invention.

Haland shows an extension plate 14 extending upward from a reinforcing bar 13 on the side door 11 of a vehicle to enable an impact into the vehicle at the position of the reinforcing bar to cause inward movement of the extension plate 14 into contact with a sensor assembly 1 to trigger it (see Figs. 3 and 4). The extension plate 14 extends around the sensor assembly 1 (see Fig. 4). Sensor assembly 1 includes a stab 9 spaced apart from pyrotechnic material within a cavity 4 in a non-arming stage. Movement of the extension plate 14 causes the stab 9 to be pushed into the pyrotechnic material with the friction effect between the stab 9 and the pyrotechnic material causes ignition of the pyrotechnic material (see page 5, lines 17-25).

Haland does not disclose a sensor having a housing with a mass in the interior of the housing and which mass is movable relative to the housing. There is no housing around the stab 9 nor is stab 9 movable in response to acceleration of the housing.

Rather, the stab 9 moves as a result of displacement of the outer skin of the vehicle, as conveyed through the extension plate 14, and not lateral acceleration thereof. This is highly disadvantageous for a crash sensor since a large force applied slowly, e.g., a truck backing into the door, will cause movement of the extension plate 14 and thus movement of the stab 9 to ignite the pyrotechnic material. However, since the truck is moving slowly, it does not have a large acceleration and hence there is no need for deployment of the occupant restraint system since it will not result in significant movement of the occupant relative to the passenger compartment.

By contrast, a sensor in the claimed embodiments provides for deployment of an occupant restraint based on acceleration as determined by movement of a mass relative to a housing which moves upon an impact, and this acceleration-based deployment is a much better criteria to use for deciding

whether to deploy an occupant restraint system. In the case of the slowly moving a large truck which impacts the side of the vehicle discussed above, although the truck will impact the vehicle with a large force, it will create only a small acceleration force and thus will not cause deployment of the occupant restraint system, such suppression of deployment being the desired objective.

There is no teaching or suggestion in Haland to modify the crash sensor to alter its deployment criteria from a deployment based on displacement of the extension plate to a deployment based on lateral acceleration of the vehicle. Such a change would fundamentally alter the characteristics of sensor of Haland and therefore would not be considered by one of ordinary skill in the art.

In view of the differences between the crash sensor as set forth in the claimed embodiments and the crash sensor of Haland, Haland does not disclose, teach or suggest the claimed embodiments.

In view of the changes to claims 1, 11 and 21 and the arguments presented above, it is respectfully submitted that the Examiner's rejections of claims 1-30 in view of Haland have been overcome and should be removed.

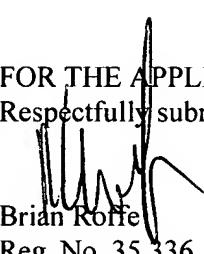
New Claims

Claims 31-33 are presented herein. The fee for presentation of three additional dependent claims, \$150, should be charged to Deposit Account No. 50-0266.

Interview Request

The Examiner is respectfully requested to contact the undersigned to discuss this case after consideration of this Amendment in order to possibly expedite prosecution of this application.

An early and favorable action on the merits upon entry and consideration of this amendment is earnestly solicited.

FOR THE APPLICANT
Respectfully submitted,

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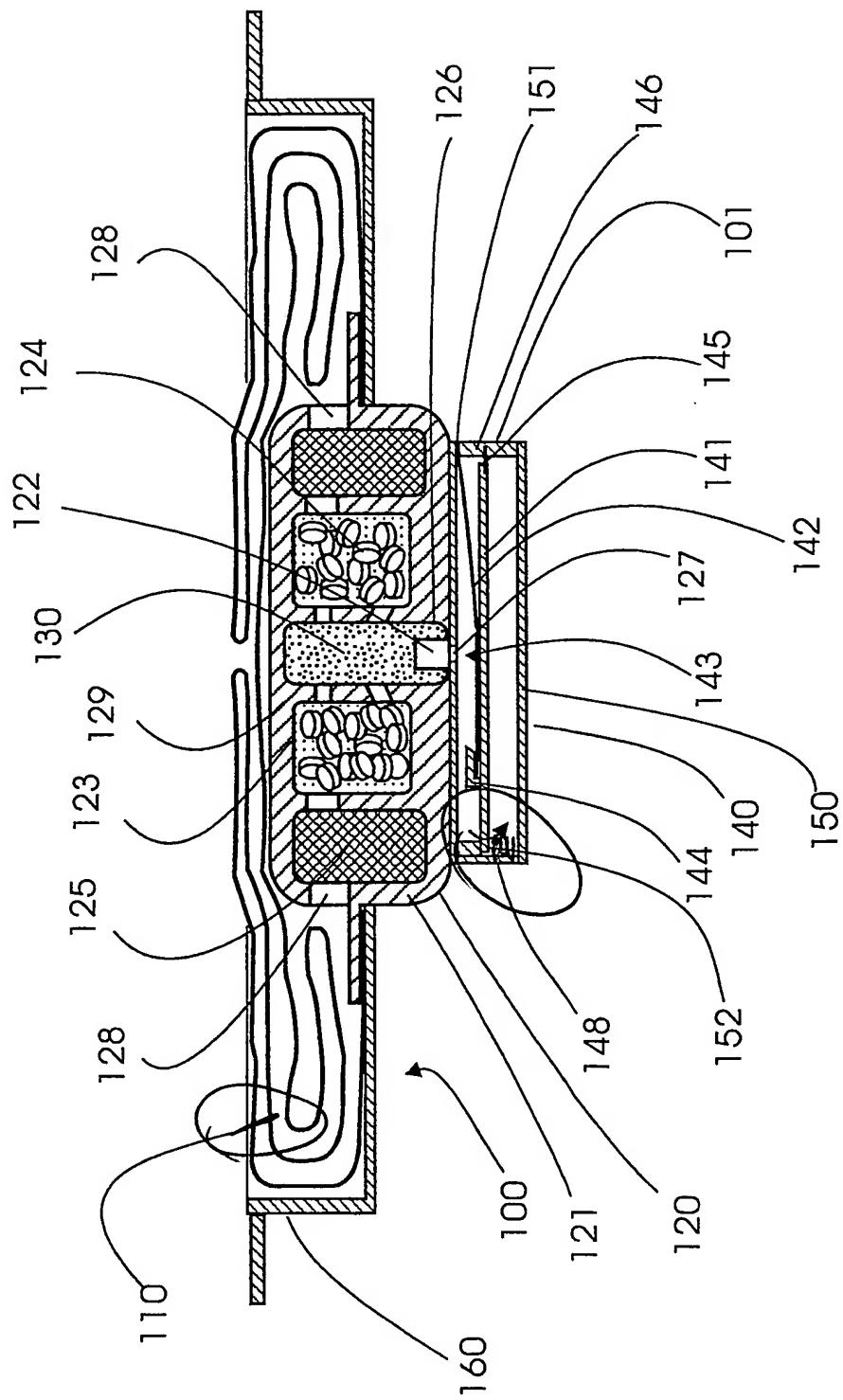


FIG. 2

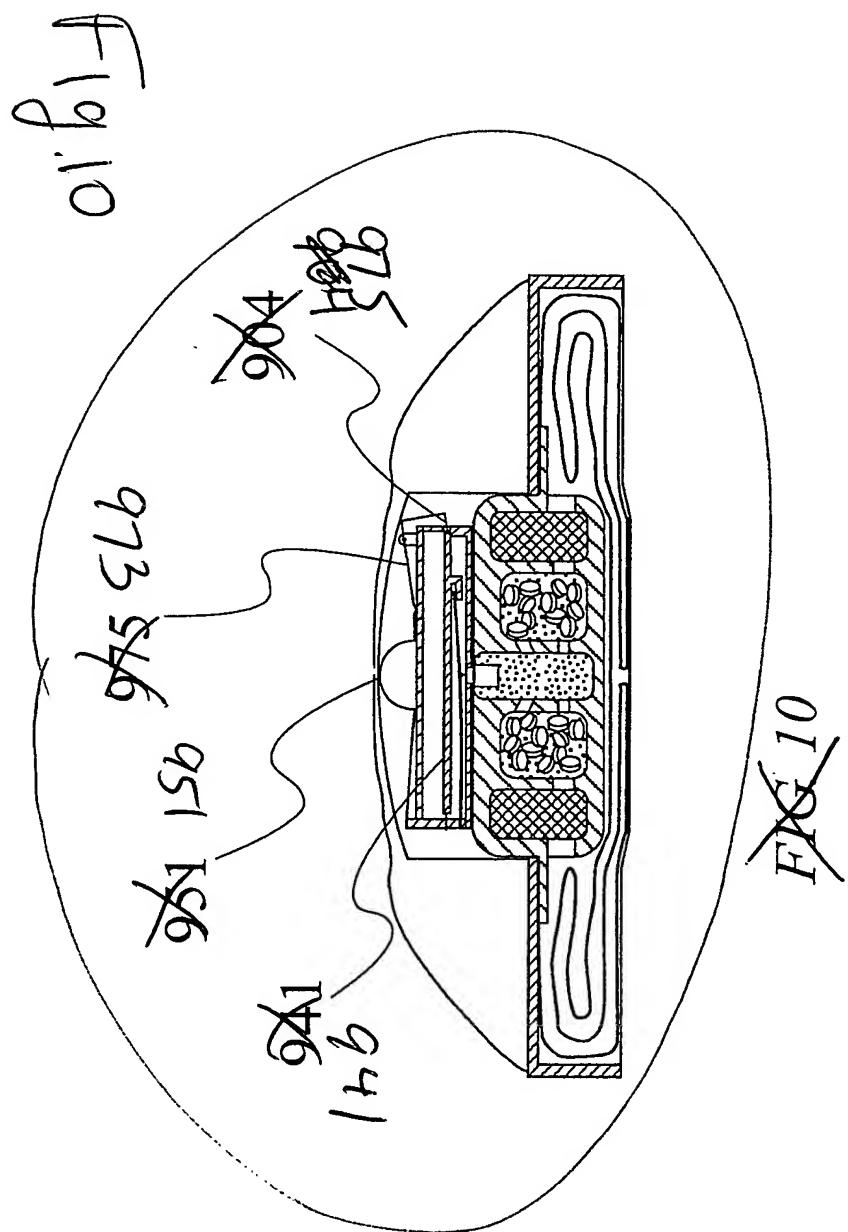
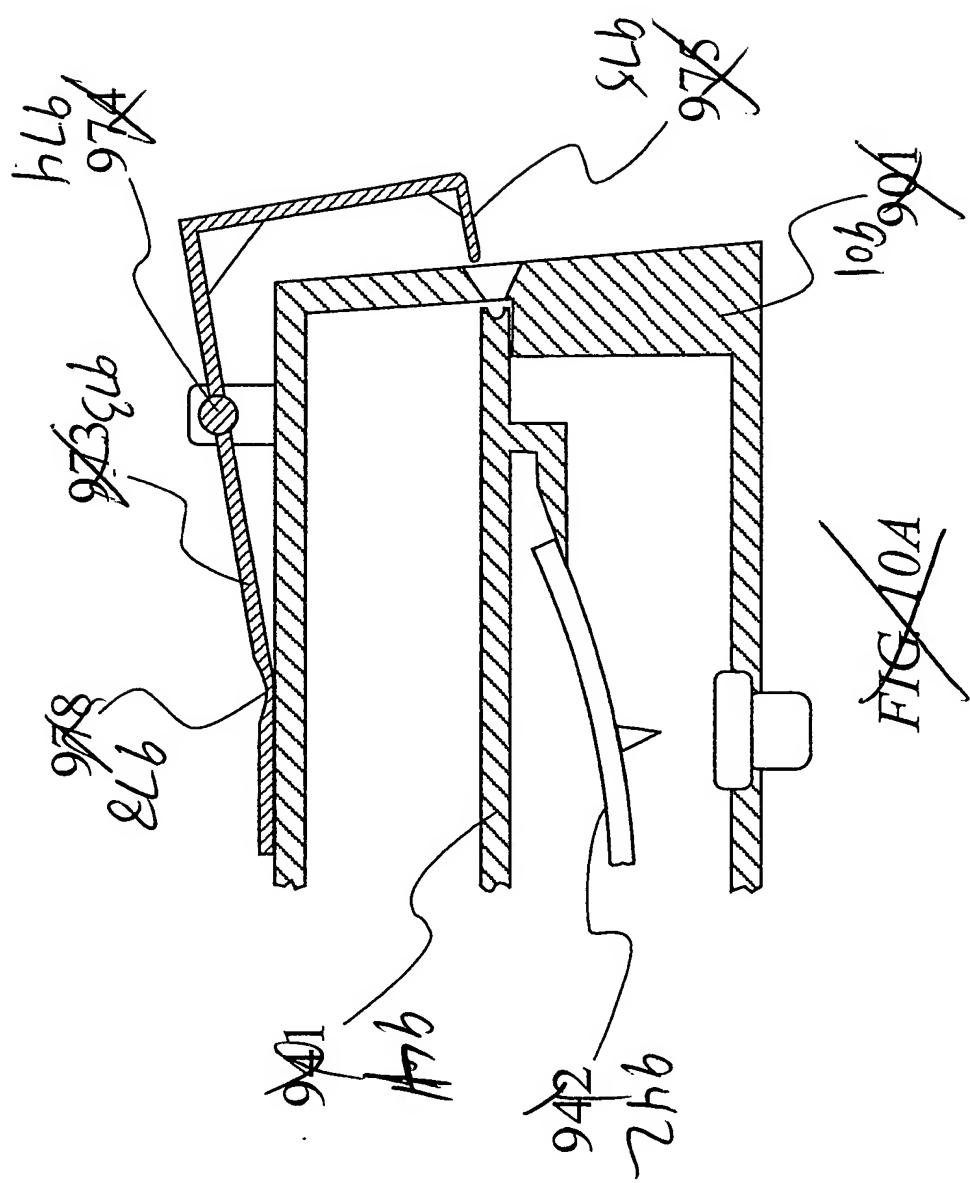


FIG. 10A



~~FIG. 10A~~

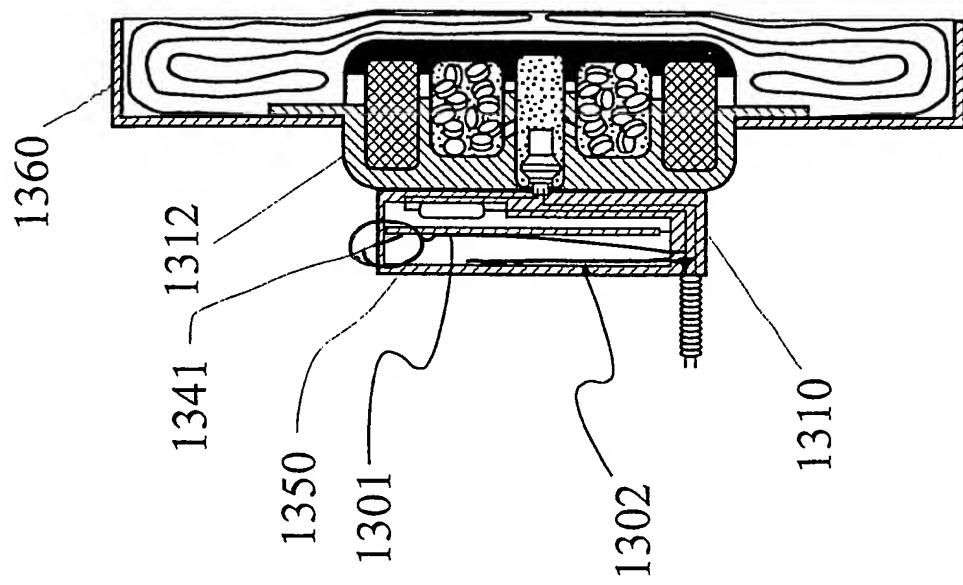


FIG. 13